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FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OH
A DEVICE FOR SIGNAL AMPLITUDE MEMORY (STORAGE), (U)
JAN 82 B V NOVOSELOV, G A BALABOLOV
FTD-ID(RS)T-1517-81

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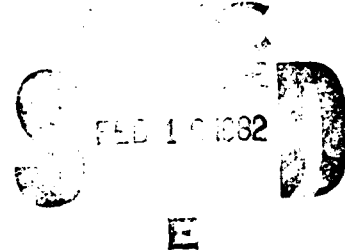
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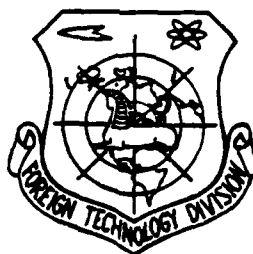
FOREIGN TECHNOLOGY DIVISION



A DEVICE FOR SIGNAL AMPLITUDE MEMORY (STORAGE)

by

B.V. Novoselov, G.A. Balabolov, A.A. Kobzev



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A DEVICE FOR SIGNAL AMPLITUDE MEMORY (STORAGE)

By: B.V. Novoselov, G.A. Balabolov, A.A. Kobzev

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Date 29 Jan 19 82

U. S. BOARD ON GEOGRAPHIC NAMES transliteration SYSTEM

Block	Italic	Transliteration	Block	Italic	Transliteration
А а	<i>А а</i>	A, a	Р р	<i>Р р</i>	R, r
Б б	<i>Б б</i>	B, b	С с	<i>С с</i>	S, s
В в	<i>В в</i>	V, v	Т т	<i>Т т</i>	T, t
Г г	<i>Г г</i>	G, g	У у	<i>У у</i>	U, u
Д д	<i>Д д</i>	D, d	Ф ф	<i>Ф ф</i>	F, f
Е е	<i>Е е</i>	Ye, ye; E, e*	Х х	<i>Х х</i>	Kh, kh
Ж ж	<i>Ж ж</i>	Ch, ch	Ц ц	<i>Ц ц</i>	Ts, ts
З з	<i>З з</i>	Z, z	Ч ч	<i>Ч ч</i>	Ch, ch
И и	<i>И и</i>	I, i	Ш ш	<i>Ш ш</i>	Sh, sh
Я я	<i>Я я</i>	Y, y	Щ щ	<i>Щ щ</i>	Shch, shch
К к	<i>К к</i>	K, k	Ъ ъ		"
Л л	<i>Л л</i>	L, l	Ы ы		Y, y
М м	<i>М м</i>	M, m	Ь ь		'
Н н	<i>Н н</i>	N, n	Э э		E, e
О о	<i>О о</i>	O, o	Ю ю		Yu, yu
П п	<i>П п</i>	P, p	Я я		Ya, ya

*ye initially, after vowels, and after e, e; e elsewhere.
When written as ё in Russian, transliterate as yě or è.

RUSSIAN AND ENGLISH TRIGONOMETRIC FUNCTIONS

Russian	English	Russian	English	Russian	English
sin	sin	sh	sinh	arc sh	sinh ⁻¹
cos	cos	ch	cosh	arc ch	cosh ⁻¹
tg	tan	th	tanh	arc th	tanh ⁻¹
ctg	cot	cth	coth	arc cth	coth ⁻¹
sec	sec	sch	sech	arc sch	sech ⁻¹
cosec	csc	csch	csch	arc csch	csch ⁻¹

Russian English

rot curl
lg log

A Device for Signal Amplitude Memory (Storage)

Originators of the invention:

B. V. Novoselov, G. A. Balabolov,
A. A. Kobzev.

The invention pertains to the field of automatics and can be employed in computer technology, where the need frequently arises for the monitoring and the memorizing (storing) various signals.

The known devices for memorizing (storing) of signals, in which a capacitor, connected to the source of the signal being measured is employed, cannot measure and memorize (store) in each half-period the maximum value of the amplitude of sinusoidal electrical signals both with a constant, and with a varying amplitude and frequency, which occur in automatic control systems.

The purpose of the proposed invention consists in the measuring and the memorizing (storing) of the amplitude value of sinusoidal electrical signals both with a constant, and also with a varying amplitude and frequency in each half-period and the reproducing at the output of the device in the following half-period a signal, proportional to the memorized (stored) value.

The purpose is achieved by employing two measuring capacitors and a control circuit, which switches to the signal being measured at each

of the half-periods one or the other measuring capacitor, as a result of which at the output of the device is obtained a signal, proportional to the amplitude value of the harmonic signal, being measured, in the previous half-period.

The electrical circuit of the device is represented in the diagram.

Capacitors 1 and 2, each of which via corresponding diode 3, 4 and a variable resistor (potentiometer) 5 is connected with the input of the device, are the signal measuring and memorizing (storing) elements at each of the half-periods. The grid of amplifier tube 6 is connected to capacitor 1 with normally open-circuited contacts 7, 8 and 9, 10 of relay 11, and to capacitor 2 - with normally closed-circuited contacts 8, 12 and 10, 13 of relay 11. Relay 11 is connected to the power supply source 14 by normally open-circuited contacts 15 and 16 of polarized relay 17, and of relay 18, shunted by capacitor 19 - by contacts 20, 21 and 22 of polarized relay 23.

Shunt-breaking resistor 24 is connected to capacitors 1, 2 by means of contacts 25, 26 and 27 of polarized relay 28, one end of the winding of which is connected with power supply source 14 via a divider, consisting of resistors 29, 30, and the second end - via differentiating capacitor 31 contacts 32, 33 or 33, 34 of relay 11 and subsequently - via diode 35 or 36. Shunt-breaking resistor 37 via normally closed-circuited contacts 38 and 39 of relay 18 is connected with the grid of tube 6.

Polarized relays 17, 23 is the load of a balanced amplifier, which is realized on the basis of two transistors 40, 41.

The device operates in the following manner.

The sinusoidal signal being measured goes to the input of the balanced amplifier, as a result of which relay 17 and 23 operates at the time of the change in the polarity of the signal and changes their groups of contacts. Relay 17 is switched on in the case of one sign of the input signal by contacts 15, 16 and is switched off by the same

contacts with the other sign of relay 11. Relay 11 is introduced into the circuit, only because one group of contacts 15, 16 of polarized relay 17 is insufficient for the operation of the circuit. Relay 11 connects with its contacts 8, 12 and 13, 10 capacitor 2 to the grid of tube 6 or capacitor 1 with contacts 7, 8 and 9, 10. These capacitors (1, 2) are charged at different half-periods of the signal being measured via diodes 3, 4 up to the amplitude value of the voltage being measured, which is supplied to them via potentiometer 5. Relay 11 is connected by the contacts 15, 16 of relay 17 in such a manner, that it connects to the grid of the tube that capacitor, which was charged in the previous half-period, and during this time the other capacitor is charged. During the supply to the grid of tube 6 of the voltage from capacitor 1 or 2 on the output of the amplifier, assembled on this tube, there appears a signal, proportional to the voltage on the capacitor, connected to the grid, and consequently, to the amplitude value of the signal being measured in the previous half-period. In order to remove the voltage existing on its plates before the charging of one of the capacitors (1 or 2), relay 28 is introduced, which operates only at the moment and for the moment of the switching of contacts 32, 33 and 33, 34 of relay 11 (i. e., at the moment of the changing of the polarity of the signal being measured). In this case, contacts 25, 26 or 26, 27 of relay 28 are closed, switching the corresponding measuring capacitor (1 or 2) to the shunt-breaking resistor 24. Diodes 35, 36 serve to eliminate the reverse current surges in the plates of relay 28.

Relay 18, which connects with its normally close-circuited contacts 38, 39 shunt-breaking resistor 37 to the grid of tube 6, serves for setting the circuit in the zero position during the switching off of the signal being measured. Relay 18 is located under current in the presence of the signal being measured, since it is cut in by contacts 20, 22 of relay 23 with one polarity of the signal and by contacts 21, 22 with the other polarity of the signal. To eliminate the operation of relay 18 with the changing of the polarity of the signal being measured capacitor 19 is introduced, which shunts the winding of relay 18, which is charged up to the voltage of power supply source 14, and at the moment of the opening of contacts 20, 22 or 22, 21 of relay 23 it is discharged to the winding of relay 18, not giving it the possibility to

operate and to close its contacts 38, 39. With the removal of the signal being measured contacts 20, 22 or 21, 22 of polarized relay 23 are opened, switching off in this case relay 18 from power supply source 14. After the discharge of capacitor 19 to the winding of relay 18 the latter closes its contacts 38, 39, switching shunt-breaking resistor 37 to the grid of tube 6 and thereby discharging the charged capacitor (1 or 2). The frequency of the signal being measured is determined by the operating speed of the relays included in the circuit.

The Subject of the Invention

The device for memorizing (storing) signal amplitudes, which contains two measuring capacitors and a transistorized control circuit, which is distinguished by the fact, that for the purpose of measuring and memorizing (storing) the amplitude value of sinusoidal voltage with a changing frequency in each half-period and reproducing on the output in the next half-period a signal, proportional to the memorized (stored) value, it will contain a balanced amplifier based on two transistors, the load of which are two polarized relays, a potentiometer, the input of which is connected to the source of the signal being measured, and the output is connected with two diodes, one of which is connected by the anode to one measuring capacitor, and the other by the cathode - to the other capacitor, three switching relays, two of which are connected to the contacts of polarized relays, and the third - by one end of the winding is connected with the power supply source via a resistor divider, and by the second end - via a differentiating capacitor and a group of contacts of a relay is connected to a shunt-breaking resistor.

